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Abstract

The present study sought to examine the effects of a brief loving-kindness meditation (LKM) training on early parenting behaviors, specifically maternal bonding and sensitivity to infant emotion cues. Postpartum women with infants aged 3-6 months were randomly assigned to complete a two-week daily LKM practice at home or to a no-intervention control. Although there was a significant improvement in maternal reports of bonding over time, there was no indication of difference by group. Moreover, although mothers were significantly better at identifying happy versus sad displays of emotion and with less intensity, there were no differences between women who practiced LKM and controls. Findings are discussed with respect to study limitations and important directions for future research.

Introduction

A large body of research has suggested that the practice of meditation has a range of beneficial physical and mental health effects on the individual (e.g., Brown and Ryan, 2003; Kabat-Zinn, 1982; Kabat-Zinn, Lipworth and Burney, 1985; Morone, Greco, and Weiner, 2008); however, only recently has research addressed the potential interpersonal benefits of meditation practice. These studies have focused specifically on a form of meditation, loving-kindness meditation (LKM), designed in part to increase a sense of connectedness with one's social world. The benefits of LKM have been investigated in three empirical studies and case studies, with results showing benefits for physical health and mental health (Carson et al., 2005; Fredrickson et al., 2008; Hutcherson, Seppala, and Gross, 2008; Johnson, Penn, Fredrickson, Kring and Brantley, 2009). Most importantly, two of these studies also have suggested interpersonal benefits in positive relations with others (Fredrickson et al., 2008) and social connectedness (Hutcherson, Seppala, and Gross, 2008). These results highlight the potential value of LKM for relationships of particular importance, such as the early relationship between a mother and her infant. The present study explored the effects of LKM on core parenting behaviors among mothers of infants aged 3-6 months.

LKM is a specific type of meditation practice that is often used to increase feelings of warmth and caring for self and others (Salzberg, 1995). Traditionally, LKM instructs practitioners to direct feelings of love and kindness following a specific progression in which attention is brought first to a loved one and from there is directed toward oneself, a neutral person, an enemy or difficult person, and last, toward all living beings (Salzberg, 1995). The LKM encourages practitioners to bring their attention to the repetition of specific phrases. Traditional examples of such phrases include: "may I be free from danger," "may I have mental

happiness," "may I have physical happiness," and "may I have ease of well-being" (Salzberg, 1995). LKM's goal differs from other forms of meditation training in that the process requires active participation to cultivate feelings of loving-kindness. As opposed to mindfulness meditation where one trains one's attention to the present in an open-minded way, LKM involves training one's warm and tender emotions in an open-hearted way (Frederickson et al., 2008).

Emerging research supports a range of interpersonal benefits associated with LKM training. Hutcherson, Seppala and Gross (2008) found that participants (n = 42) who completed a brief (7-minute) practice aimed at cultivating positive regard demonstrated significant effects on implicit and explicit positivity toward neutral strangers in comparison to those that completed a neutral imagery task (n = 45). In addition, Fredrickson and colleagues (2008) found that the practice of LKM was associated with a range of benefits in the domain of positive emotion as well as specific interpersonal benefits. Participants were randomly assigned to a waitlist condition (n = 72) or a seven-week class that taught LKM (n = 67). LKM meditation did in fact increase daily experience of positive emotions (amusement, awe, contentment, joy, gratitude, hope, interest, love, and pride) and the fostering of positive emotions resulted in increases in resources including positive relations with others.

The early postpartum period represents a time in many women's lives of high demands for interpersonal engagement and represents a period ripe for investigation of practices such as LKM. The early mother-infant relationship is crucial for an individual's development as it prepares an infant for its social existence in the world. Siegel (1999) asserted that in an attempt to regulate their bodily and mental states, children look for direction from their caregiver through emotional communication and aligning states of mind and that the interactions infants have with their primary caretakers are paramount for both the psychological and neural development of the

child. He suggests that nonverbal communication, facial expressions, subtleties in tone of voice, and emotional attunements will be adversely impacted in the 'experience-dependent maturation' of this child's right hemisphere Siegel (1999).

Additionally, Landry, Smith, Swank, Assel and Vellet (2001) conducted a study examining the role of early versus ongoing parenting responsiveness on child outcomes of social responsiveness, cognitive skills, and language skills in a sample consisting of preterm children (n = 179) and full-term children (n = 103). Landry et al. (2001) found while there is no developmental advantage to having a mother who shows high levels of responsiveness only early, it is crucial for mothers to consistently display high levels of responsiveness through the school years to meet the child's cognitive needs and sustain a positive developmental trajectory. In this way, the parent shapes the way the child interacts in the world.

The salience of maternal infant relationships also is observed in studies of mothers who struggle with aspects of early parenting, such as depressed women. In cases in which the mother-infant relationship is strained, the infant has greater risk of being set on a suboptimal trajectory of development. Thus, parenting practices could become a life stressor for a child (Caldji et al., 2000; Newport et al., 2002; Sanchez et al., 2001) and increase risk of psychopathology or significant developmental impairments (e.g., Cicchetti and Toth, 1998). In fact, some data suggest that negative parenting behaviors among depressed postpartum women are reciprocated by the infant as early as age 3 months, which in turn evokes negative responses from strangers (Field et al., 1988).

Although a range of parenting tasks may be modifiable as a result of training, findings with other populations suggest that LKM may be particularly relevant to parenting tasks of emotion sensitivity and connection. Emotional sensitivity is crucial for any interpersonal

relationship, but is especially so in the mother-infant dyad as emotions (facial expressions and body language) are the main form of communication between a mother and her baby. By three to four months of age, infants are able to discriminate static happy, sad and surprised facial expressions (N = 80; Young-Browne, Rosenfeld and Horowitz, 1977). By 7 months of age, infants are able to distinguish dynamic displays of angry and happy faces (N = 50; Soken and Pick, 1992). At 4 years of age, children can freely label prototypical displays of happiness, sadness and anger with almost perfect accuracy (N = 320; Widen and Russell, 2003). Interestingly, though, by adulthood, individuals no longer correctly label basic emotions with perfect accuracy. In 1985, Babchuk, Hames and Thompson (N = 40) found that the infant facial expressions most accurately recognized were joy (98.3%), surprise (81.1%), interest (79.9%), and sadness/distress (75.5%), while the most poorly identified were anger (54.4.%), fear (17.8%) and disgust (2.5%).

A crucial aspect of emotional availability in the mother-infant dyad is emotional sensitivity both on the side of the mother as well as the infant. Biringen (2000) proposes that parental sensitivity entails affective interactions and negotiations of conflict as well as dyssynchronous interactions. To be emotionally sensitive, the mother needs to be able to accurately pick up on her child's emotional signals and also be aware of the way she is emitting hers (Biringen, 2000). Brinigen (2000) argues that emotional sensitivity includes responsiveness, both physical and emotional, to the child's physical and emotional signals and communications.

Tronick (1989) explained that the affective communication between a mother and a child has effects that are visible as the child develops. In every dyad between two people, emotional signals by each member are displayed at any given moment. For example, in a mother-infant dyad where both mother and baby are playing and the baby turns away, it might mean the infant

no longer wants to play. If the infant's mother can correctly recognize her baby's emotions, she might stop playing and change activities. On the other hand, if the mother cannot correctly interpret her baby's signals, she might attempt to repeatedly reengage the infant in play once again or simply ignore the infant. Both instances would create a rupture in communication and inspire negative affect (Tronick, 1989). Tronick (1989) explains that in situations where there are repeated conflictual negative exchanges, the infant will look at his mother less, develop more negative affect, and become more distressed under conditions of stress. In the long run, this infant will become more withdrawn and exhibit more sadness (Tronick, 1989). Being able to effectively read emotions within the mother-infant dyad promotes a positive relationship and fosters an environment for healthy attachment. Emotional sensitivity requires the mother to correctly recognize her infant's emotions and act appropriately to them.

Siegel (1999) proposes that the type of interpersonal communication that facilitates autonomous self-regulation begins with healthy dependence that involve sensitivity to the child's signals, contingent communication, and reflective dialogue that permits the child to develop coherence and mentalizing capacities (Siegel, 1999). Thus, emotional attunement and responsiveness are crucial for development so that parental interactions with the child enable to child to develop a sense of security, a belief in their competence, and the ability to stay focused on their social partners, regulate their emotions, and co-ordinate their actions with the actions of others (Dix, Cheng, and Day, 2009).

Closely related to emotional sensitivity during early parenting is the quality of the relationship between the mother and infant; in particular, bonding with one's infant is another core task of early parenting. Myers (1984) defined bonding as a process that occurs when a mother forms an affectionate attachment to her infant soon after birth. A crucial step for bonding

to occur is emotional attunement between mother and child. To be emotionally attuned, both the mother and the infant need to be responsive to each other. Caregivers need to be sensitive and responsive to their infant, and eventually both will become emotionally attuned, leading to improvements in the bonding quality between both parties. However, before a caregiver can be responsive, he or she will first need to be emotionally available - the degree to which each partner expresses emotions and is responsive to the emotions of the other (Emde and Easterbrooks, 1985). Essentially, being emotionally attuned allows for bonding in the mother-infant dyad.

Emotional attunement and responsiveness are the main ingredients for healthy interpersonal relationships, and specifically in mother-infant bonding. In fact, the crucial ingredient for attachment relationships is "feeling felt" as these attachments give way to the interactive sharing of states, which facilitates the amplification of positive, enjoyable emotions and the diminution of negative, uncomfortable emotions (Siegel, 1999). Dix, Cheng and Day (2009) propose that children must come to want to interact with parents, and they must develop patterns of action that elicit parents' input and involvement in their activities in order to develop optimally. This sense of control and autonomy has the power to set the stage for other interpersonal connections through the individual's life.

The absence of bonding becomes problematic in interactions within the mother-infant dyad in its implications for development as not being able to emotionally connect with other individuals may lead to social isolation, which may become a stressor later on (Caldji et al., 2000; Newport et al., 2002; Sanchez et al., 2001). Relying on interpersonal relationships might be a coping mechanism under times of stress, which could foster emotional wellbeing. Thus, cultivating meaningful relationships with other people has an evolutionary significance and

could set individuals on a trajectory towards a healthy life.

Given the promising findings of the positive impact of LKM on increasing a variety of interpersonal outcomes and the critical importance of similar interpersonal dimensions for early parenting, the present study investigated the hypothesis that, as compared to a no-intervention control, participants assigned to a LKM condition will demonstrate significantly greater improvement on self-report and standardized behavioral measures of core early parenting tasks. The present report focused on two core components of early parenting – bonding and emotional sensitivity. Specifically, we predict that mothers who practice LKM will demonstrate significantly greater increases over the course of the intervention in bonding to their infant as measured by self-report on a scale of postpartum bonding (Postpartum Bonding Instrument; PBI; Brockington et al., 2001). We also predict that mothers who practice LKM will demonstrate significantly greater emotional sensitivity to infant emotion cues as evidenced by performance post-intervention on a standardized behavioral task in which infant facial emotion cues are presented. We predict that mothers who practice LKM will identify infant displays of both happy and sad emotion with higher accuracy and that they will identify such displays at lower levels of intensity than control mothers.

Methods

Participants

The University of Colorado Institutional Review Board (IRB) approved study procedures, and all participants provided written informed consent prior to enrollment in the study. Participants (N = 37) included English-speaking postpartum women over the age of 18 with infants between 3 and 6 months of age, who were delivered full term (at least 37 weeks

gestation). Participants were recruited through the use of flyers, email listserv, and community print and online advertisements.

Since the present study was a subset of a larger project ("The Mothers and Babies Project") examining the effects of attention on early parenting among "never depressed," "formerly depressed," or "currently depressed" mothers, potential participants had to fit the following entry criteria. Women in the "formerly depressed" group (n = 11) had a history of Major Depressive Disorder (MDD) as measured by the *Structured Clinical Interview for DSM-IV* (*SCID-I*; First, Spitzer, Gibbon, and Williams, 1995*)*, but did not currently meet diagnostic criteria for MDD and did not evidence clinically significant depressive symptoms as measured by the *Edinburgh Postnatal Depression Scale* (EPDS; Cox et al., 1987). Additionally, women in this group were required to not have a lifetime diagnosis of Bipolar Disorder or Psychotic Disorder, or meet criteria in the last six months for alcohol abuse, substance abuse, Panic Disorder or Obsessive-Compulsive Disorder. Women in the "never depressed" (n = 26) group were required to be without a prior history of depression or any other lifetime major Axis I disorder (measured by the SCID-I; First, Spitzer, Gibbon, and Williams, 1995) and to be without clinically significant depressive symptoms as measured by the EPDS (Cox et al., 1987). Given the focus on parenting outcomes broadly and the lack of power to examine differences by depression subgroups, this study focuses only on comparisons between the intervention conditions (LKM versus control).

Procedure

Participants contacted the project coordinator directly. An initial phone screen was administered to all women, following which potentially eligible women were scheduled for a baseline assessment. At that time, participants read and signed a consent form and the SCID

(First, Spitzer, Gibbon, and Williams, 1995*)* was administered. All participants were then asked to fill out a series of self-report measures; for the purpose of this study, we focus on a subset of those measures, as described below.

Following the baseline assessment, participants were randomly assigned to a no treatment control condition or the LKM condition. Participants randomized into the control condition (n = 18) were not asked to engaged in any practice between the baseline and post-intervention assessments; however, all other aspects of the study were the same. Participants in the LKM condition (n = 19) listened to an audio-recorded meditation practice (five minute introduction and 18 minute guided meditation) daily for two weeks. The LKM practice was recorded by Sharon Salzberg (Salzberg, 1995, 2005) and was informed by scripts used for home practice in the Fredrickson and colleagues' (2008) study. The LKM practice guides participants first to focus attention on the experience of receiving loving-kindness from a person they admire. Next, they are asked to extend those feelings to themselves and then to their babies. Participants were instructed to listen to the guided practice a minimum of ten times through the course of a two-week period and to keep a log of their daily practice. At the end of two weeks, all participants returned to the lab to complete the post-intervention set of questionnaires and the behavioral emotion sensitivity task.

Measures

The specific dependent variables that are a focus of this study include self-reported early bonding (PBI; Brockington et al., 2001) and performance on a standardized behavioral task of infant emotion identification (Morphed Faces Task*;* Niedenthal, Halberstadt, Margolis, and Innes-Kerr, 2000).

The 25-item PBI (Brockington et al., 2001) includes four subscales: “impaired bonding”, “rejection and anger”, “anxiety about care”, and “risk of abuse.” The “impaired bonding” subscale provides an overall assessment of early mother-infant relationship quality and the “rejection and anger” subscale indicates severity of relationship problems. The final two subscales were not of primary relevance to the current study as they focus specifically on mothers with anxiety and indicators of imminent risk for abuse. A sample question from the “impaired bonding” scale is “I feel close to my baby” (reverse scored), and one from the “rejection and anger” subscale is “I regret having this baby.” Responses are provided on a zero to five Likert-type scale ranging from “never” to “always.” Higher scores indicate greater difficulty with bonding, ranging from zero to 60 on the “impaired bonding” subscale and zero to 35 on the “rejection and anger” subscale.

Emotional sensitivity was measured by performance on a standardized behavioral task (Morphed Faces Task*;* Niedenthal, Halberstadt, Margolis, and Innes-Kerr, 2000) in which women were asked to respond to infant facial expressions. The Morphed Faces Task (Niedenthal, Halberstadt, Margolis, and Innes-Ker, 2000) was administered only at the post-intervention assessment. In this task, participants were shown the two most common infant facial expressions of emotion (sad and happy) in images of facial expression that morphed from neutral to either emotion. Each face shown in a sequence gradually increases in intensity by 2%. Participants viewed the morphing faces on a computer screen and indicated the point at which they identified the emotion as happy or sad by pressing the spacebar. For each emotion represented, participants are shown two versions (male and female) of five happy faces and five sad faces with each face being shown twice for 500ms each. 70 faces are shown, though only 50 differed in intensity. The rationale is that this increases the task’s difficulty and attempts to

eliminate a perfect correlation between time and intensity. This behavioral task was selected as it mimics the morphing of facial expressions that happen in exchanges of interpersonal communication with between a mother and infant. In daily life, facial expressions are dynamic and change rapidly. Thus, decoding those facial expressions are crucial for our interpersonal interactions. For the purposes of the present study, we are interested in exploring accuracy in identification of infant emotions (subtracting from one the number of incorrect answers over total number of faces) as well as measuring the intensity of the emotion required for mothers to identify emotions (calculated by recording the face at which mothers identified an emotion as each face is tied to a specific intensity).

Results

Baseline Characteristics

Table 1 presents participant baseline demographic and clinical characteristics. Briefly, participants were, on average, 32 years old, predominately White, well educated, and married or cohabiting. Few participants were receiving mental health or other interventions; and nearly half the sample had some experience with a contemplative practice (meditation, yoga). There were no differences in baseline demographic characteristics between the control and LKM conditions as indicated by independent samples t-tests and chi-square tests for categorical variables.

Maternal Bonding

The overall quality of maternal bonding was assessed via self-report on the "impaired bonding" scale of the PBI (Brockington et al., 2001). Our analysis of change from baseline to post-intervention using a general linear model (GLM) indicated a significant decrease in problems with bonding from baseline ($M = 6.37$, $SD = 4.54$) to post-intervention across all participants ($M = 5.29$, $SD = 3.55$; $F\ (1, 29) = 4.35$, $p = 0.046$). However, the interaction

between time and condition was not significant (F (1, 29) = 0.02, p = 0.886), indicating no differences between women assigned to LKM (baseline, M = 6.40, SD = 3.16; post-intervention, M = 5.47, SD = 2.75) and control (baseline, M = 6.50, SD = 5.74; post-intervention, M = 5.69, SD = 4.25; see *Figure 1*).

Analysis of the indicator of severity of relationship problems (the "rejection and anger" subscale) indicated a low level of severity for all participants at baseline and across time. Using a GLM, across all participants, there was a significant difference between baseline (M = 2.81, SD = 2.69) and post-intervention scores (M = 2.29, SD = 2.13; F (1, 29) = 4.18, p = 0.05). However, the interaction between time and condition was not significant (F (1, 29) = 0.68, p = 0.42), indicating no differences between control (baseline, M = 3.31, SD = 3.05; post-intervention, M = 2.69, SD = 2.63) and LKM (baseline, M = 2.47, SD = 2.27; post-intervention, M = 2.20, SD = 1.52; see *Figure 2*).

Emotional Sensitivity

A paired samples t-test was used to examine differences in accuracy of baby emotion identification mean scores for happy and sad displays of emotion. There was a significant difference in accuracy rate between happy (M = 0.96, SD = 0.08) and sad (M = 0.83, SD = 0.12) baby emotions such that participants, overall, were better at identifying happy displays of emotion (t (34) = 7.74, p < 0.001; see *Figure 3*). An independent samples t-test was used to examine differences in accuracy of baby emotion identification mean scores between the control (n = 18, M = 0.90, SD = 0.04) and LKM conditions (n = 17, M = 0.89, SD = 0.12). There was no evidence of difference by condition in accuracy rates for happy and sad emotions, collapsed across emotion (t (33) = 0.25, p = 0.81; see *Figure 4*)**.** We used a GLM to explore the interaction between condition and emotion on accuracy. There was no significant interaction between

condition and emotion (F (1, 33) = 1.25, p = 0.27) suggesting no differences between control (happy accuracy, M = 0.97, SD = 0.04; sad accuracy, M = 0.83, SD = 0.09) and LKM (happy accuracy, M = 0.94, SD = 0.10; sad accuracy M = 0.84, SD = 0.15; See *Figure 3*).

Examining the effect of emotion on intensity needed to identify infant displays of happy and sad emotions using GLM, results indicated a significant effect of emotion on intensity (F (1, 33) = 12.54, p = 0.001; see *Figure 5*) such that study participants, overall, identified displays of happy infant expressions (M = 39.82, SD = 13.24) at a lower intensity than sad infant expressions (M = 45.44, SD = 11.73). A paired samples t-test was used to examine differences in intensity needed to identify infant displays of happy and sad emotions between control (M = 43.61, SD = 14.31) and LKM (M = 41.70, SD = 8.70). Our analysis revealed no significant difference by condition (t (33) = -0.48 p = 0.63; see *Figure 6*). A GLM exploring the interaction between condition and emotion on intensity indicated no significant interaction (F (1, 33) = 0.34, p = 0.57), indicating no differences between control (happy intensity, M = 38.45, SD = 10.95; sad intensity, M = 44.96, SD = 8.28) and LKM (happy intensity, M = 41.28, SD = 15.22; sad intensity, M = 45.95, SD = 14.80; See *Figure 5*).

Discussion

The sense of being bonded with one's infant and the ability to identify infant emotion cues are important elements of effective early parenting. Contrary to our hypothesis that a brief practice of LKM would enhance these parenting domains, there was no evidence that mothers assigned to the LKM condition evidenced superior outcomes to mothers assigned to a no-intervention control group. Specifically, there were no differences by group in self-reported bonding over time (although all mothers reported improvement) and no differences in accuracy

of emotion identification or intensity required to identify emotion at post-intervention (although all mothers were better at identifying happy versus sad displays of emotion).

These findings do not support the use of LKM to promote early positive parenting behaviors. Among this sample of mothers of infants, there were no benefits to self-reported bonding or emotion sensitivity, despite the fact that prior studies have suggested benefits of LKM practice along similar dimensions. For example, Duncan and Bardacke (2010; N = 27) used LKM as part of a mindfulness-based childbirth and parenting education program and found that women who participated in their intervention reported significant decreases in pregnancy anxiety and significant increases in mindfulness and positive affect. Additionally, LKM has shown promising results in increasing positive relations with others (Fredrickson et al., 2008) and social connectedness (Hutcherson, Seppala, and Gross, 2008).

It is important to note, however, that there were several limitations to this study. Given that this was the first study of its kind utilizing LKM with mothers and using the outcome measures in a longitudinal context, we did not have a basis for estimating the power to detect significant differences between groups. However, it is likely that the sample size may be limiting our ability to find small differences between conditions. In addition, it may be that the LKM practice period was too brief to evidence robust effects on parenting domains; future studies may want to extend frequency or duration of the guided practice longer than for two weeks. Moreover, although the current study relied on a multimodal assessment of parenting behaviors, including both self report and behavioral task, it is possible that some effects of LKM are more easily detected by observation. Future research will examine observer rated differences in maternal infant interaction using the *Emotional Availability Scales* (EAS; Biringen, Robinson, and Emde, 1998) to examine the domains of maternal sensitivity, maternal

structuring/intrusiveness, and maternal covert and overt hostility.

It also is possible that the effects of LKM may be moderated by individual differences such as depression status. Differences between groups in this study may have been attenuated by ceiling effects as our sample was not an impaired population (i.e., no women were depressed at the time of the study). Our means for "impaired bonding" (M = 5.83) and "rejection and anger" (M = 2.55) were similar to those that the developers of the scale found in healthy populations (Brockington et al., 2001; "impaired bonding, M = 6.1; "rejection and anger, M = 3.1); however, significant impairment was noted in that study among psychiatrically ill women.

In conclusion, this study was a first step in exploring the potential application of LKM among postpartum women and their infants. Parenting is one of the toughest and most important developmental tasks that many women face; however, it also is one that has the ability to influence the wellbeing of generations to come. Future studies that address some of the limitations of the current study are warranted given the importance of the task of parenting, the benefits associated with LKM in other studies, and the needs of subpopulations of mothers who may benefit from practices designed to promote early engagement and emotional sensitivity.

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Table 1

Baseline Demographic Characteristics

	Total (N=35)	**Control (n=16)**	**LKM (N=17)**
Age: Mean (SD)	32.42 (4.98)	32.56 (3.97)	32.29 (5.89)
Income Before Taxes: Median	$50,000-59,000	$50,000-59,000	$40,000-49,000
Ethnicity (n=35): %			
White	85.7%	76.5%	94.4%
Hispanic	5.7%	11.8%	--
Asian/Pacific Islander	2.9%	5.9%	--
Education (n=33): %			
Graduated 4-year college	31.4%	41.2%	22.2%
Completed grad./prof. school	40.0%	35.3%	44.4%
Part college (did not graduate)	17.1%	11.8%	22.2%
Part grad./prof. school	5.7%	5.9%	5.6%
Religious Affiliation (n=35): %			
None	37.1%	29.4%	44.4%
Other	22.9%	11.8%	33.3%
Protestant	17.1%	23.5%	11.1%
Jewish	5.7%	5.9%	5.6%
Buddhist	5.7%	11.8%	--
Catholic	2.9%	5.9%	--
Islam	2.9%	5.9%	--
Current Relationship (n=35): %			
Married	71.4%	76.5%	66.7%
Living with significant other	17.1%	11.8%	22.2%
Never married	5.7%	5.9%	5.6%
Number of Children (n=35): %			
One	51.4%	52.9%	50%
Two	37.2%	35.3%	38.9%
Three	2.9%	--	5.6%
One half time/one full time	2.9%	5.9%	--
Seeing Mental Health Professional (n=33): %	8.6%	5.9%	11.1%
Using Medication for Mental Health (n=33): %	2.9%	--	5.6%
Using Alternative Medicine for Mental Health (n=33): %	8.6%	11.8%	5.6%
Currently Practice Mindfulness, Medication or Yoga (n=33): %	45.7%	41.2%	55.6%

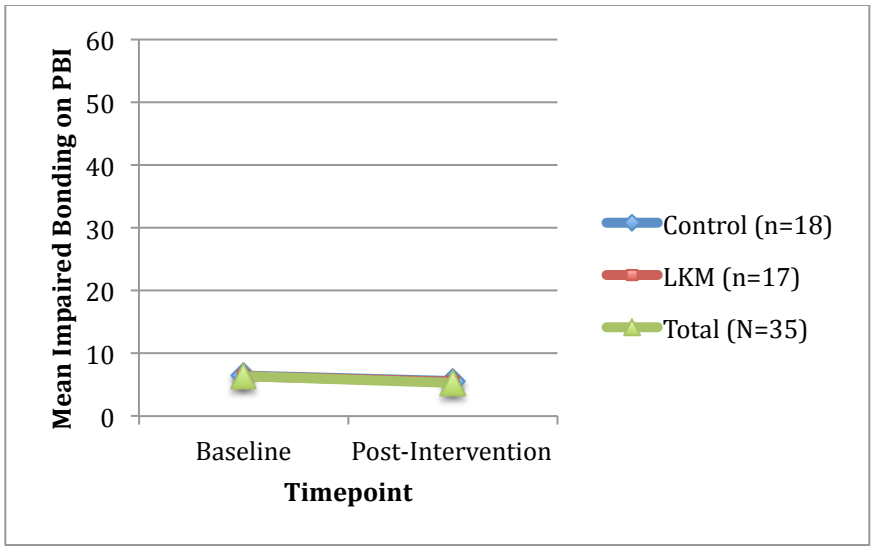

Figure 1: Mean scores on "impaired bonding" from baseline and post-intervention for control condition, LKM condition and total sample. A significant difference was found in the total sample from baseline to post-intervention, but there were no significant differences between conditions.

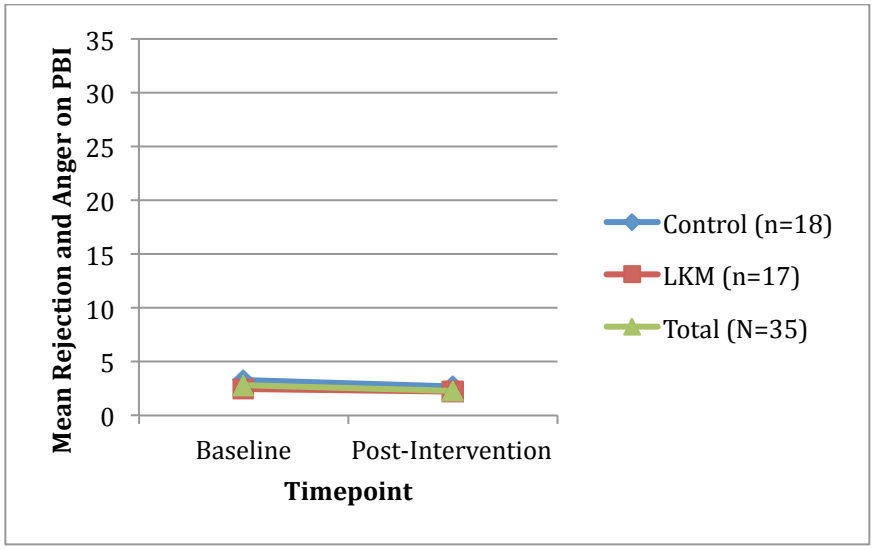

Figure 2: Mean scores on "rejection and anger" from baseline to post-intervention for control condition, LKM condition and total sample. There were significant differences were found in the total sample from baseline to post-intervention, but there were no significant differences by condition.

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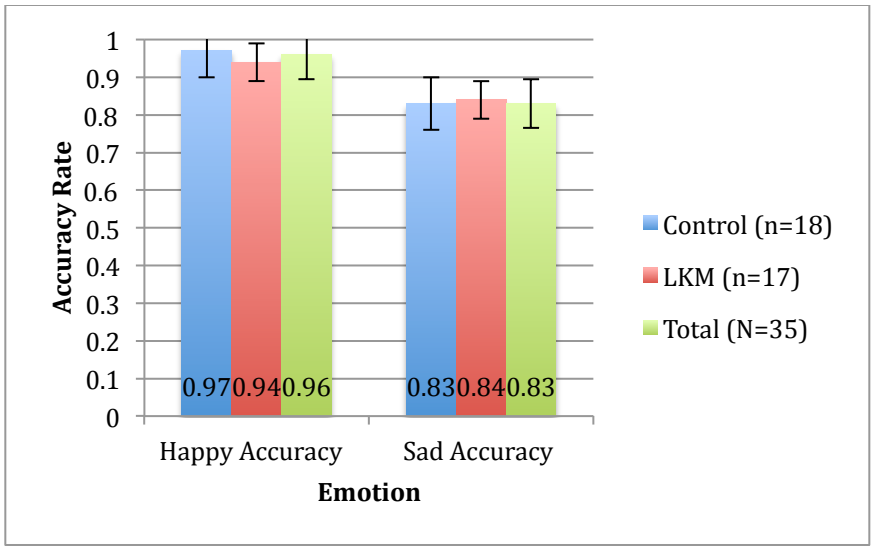

Figure 3: Mean accuracy scores on "Morphed Faces Task" by emotion for control condition, LKM condition and total sample. A significant difference was found in the total sample in accuracy of happy and sad emotions. There were no significant differences between conditions on accuracy. Standard errors are represented in the figure by the error bars attached to each column.

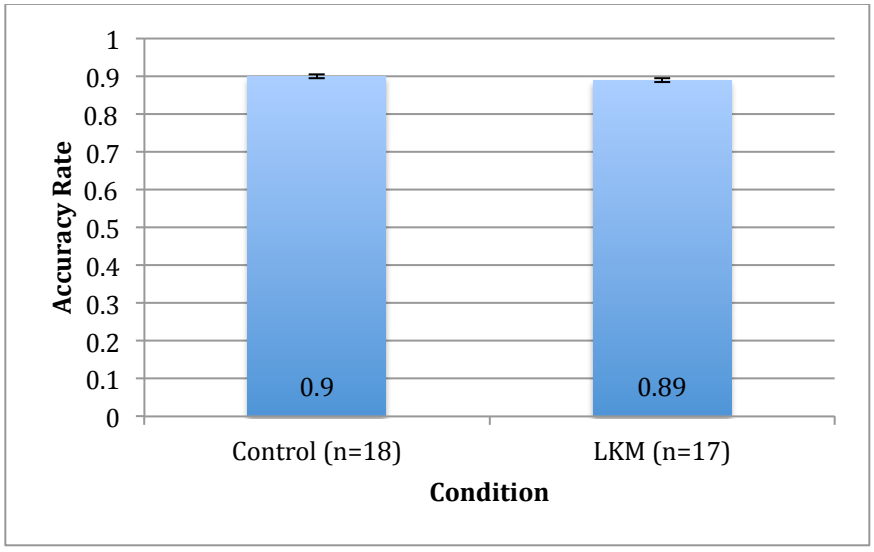

Figure 4: Mean accuracy scores on "Morphed Faces Task" between control condition and LKM condition. No significant difference between conditions was found on accuracy. Standard errors are represented in the figure by the error bars attached to each column.

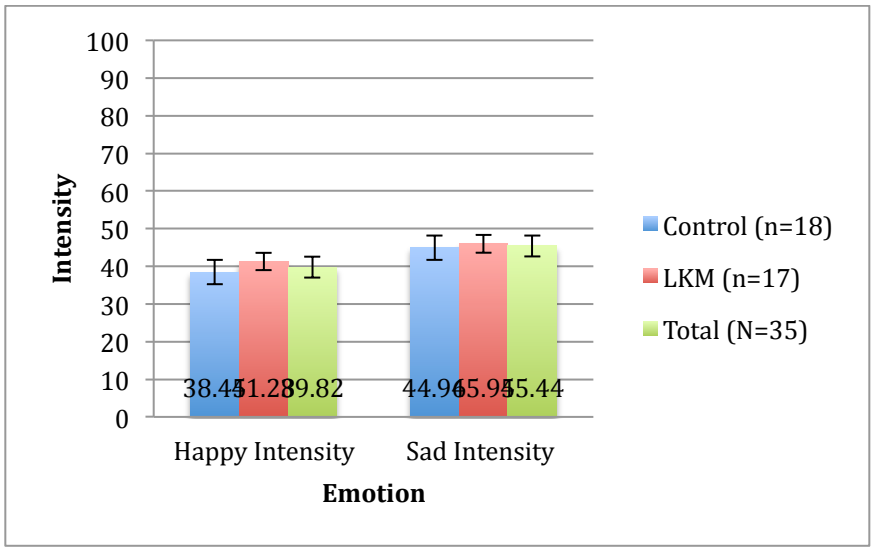

Figure 5: Mean scores of intensity on "Morphed Faces Task" by emotion for control condition, LKM condition and total sample. A significant difference was found in the total sample for intensity needed for identification between happy and sad emotions. There were no significant differences between conditions on intensity. Standard errors are represented in the figure by the error bars attached to each column.

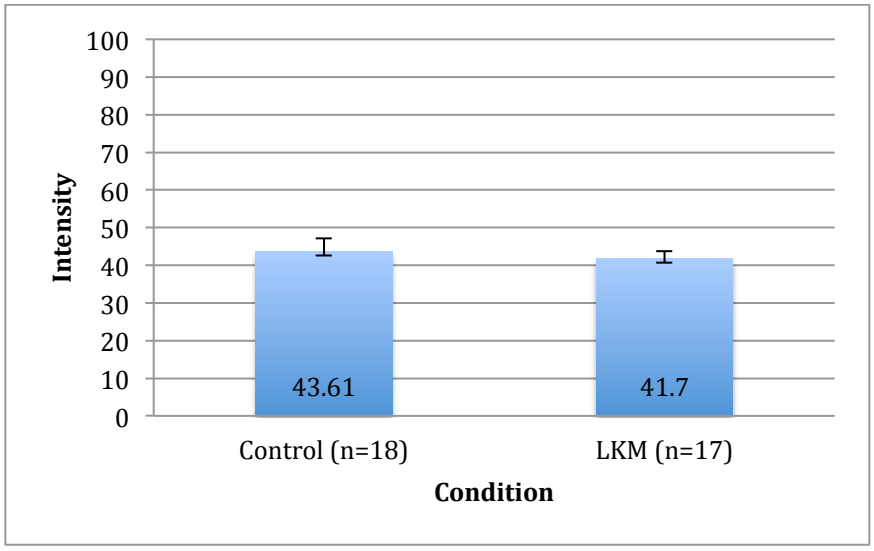

Figure 6: Mean scores of intensity on "Morphed Faces Task" by condition. No significant differences in intensity needed for identification of emotion by condition was found. Standard errors are represented in the figure by the error bars attached to each column.